REMARKS

Reconsideration of the instant application is respectfully requested. The present submission is responsive to the Final Office Action of November 2, 2004, in which claims 1-20 remain pending. Of those, claims 21-25 have been withdrawn as being directed toward a non-elected invention.

In the present action, claims 1 and 11 are now rejected under 35 U.S.C. §103(a), as being unpatentable over U.S. Patent 6,426,254 to Kudelka, et al., in view of U.S. Patent Publication 2002/0105019 by Mandelman, et al. The remaining claims (2-10, 11-20) stand rejected as set forth in the previous Office Action of June 15, 2004. For the following reasons, however, it is respectfully submitted that the application is in condition for allowance.

As an initial matter, it is noted that originally filed claims 24 and 25 (currently withdrawn from consideration) are dependent from base independent claims 1 and 11, respectively. As such, the original restriction requirement of April 26, 2004, should have designated Group I (method) as including claims 1-20, 24 and 25, with Group II (structure) as including claims 21-23. Accordingly, the Applicants respectfully request claims 24 and 25 be reconsidered prior to the next communication from the Office.

With regard to the newly cited basis for the §103 rejections to claims 1 and 11, the Applicants respectfully traverse the same for the reasons that neither Kudelka nor Mandelman (alone or in combination) teaches that the buried plate is self-aligned to the shaped upper portion of the deep trench. In the prior Office Action of June 15, 2004, the Examiner indicates in paragraph 5 that Kudelka discloses "...shaping an upper portion of the deep trench (prepare for forming collars; lines 53-67, Col. 4)..." and further that "...the buried plate is self aligned to the upper portion of the deep trench (lines 4-15, Col. 5; Fig. 5)...".

Upon further review of Kudelka, the Applicants respectfully submit that in fact neither of those claimed features are taught or disclosed therein. First, Col. 4, lines 53-67 of the Kudelka specification simply discuss various ways to form the oxide collar 116 shown in Figure 4. In particular, Kudelka states that "[a] collar 116 is formed in an upper portion of trench 110. Collar 116 is formed on substrate 102 by performing an oxidation process (for example a local oxidation of silicon (LOCOS)) of the silicon in substrate 102...Other processes may be employed to form collar 116 as well. For example, a TEOS deposition process may be employed." (Col. 4, lines 57-66). However, there is no mention of shaping the upper portion of the Kudelka trench 110 in preparation of forming the collar 116.

Moreover, since Kudelka fails to disclose a shaped upper portion of a deep trench, it further follows that there is no teaching therein of self alignment of the buried plate to the shaped portion of the deep trench, as is presently claimed. Although Kudelka discusses a "self-aligned method for forming buried plate 112" in column 5, lines 4-15, it is readily apparent that such "self-alignment" is not implemented with respect to a shaped upper portion of the trench, as claimed. In fact, the buried plate formation shown in Figures 5 and 6 of Kudelka takes place prior to any trench shaping. (Kudelka, column 5, lines 5-6) Therefore, the buried plate cannot be considered to be self aligned to a shaped upper trench.

The Applicants have also reviewed the Mandelman publication, which also does not disclose shaping of an upper portion of the trench without shaping the lower portion of the trench. In particular, paragraphs [0050]-[0057] and Figures 6D-6M of Mandelman are directed toward forming an oxide collar 18, divot filled collar oxide region 26, trench top oxide 28 and gate conductor 32. The process forming steps (while involving the formation and removal of materials such as polysilicon placeholder materials and etch stop liner materials, for example) make no particular mention of shaping the upper portion of the trenches 16 themselves without shaping the lower portion.

Finally, newly added claims 26 and 27 are presented to further recite that the dopant source (e.g., ASG layer 208 of the present embodiments) also acts a mask to protect the lower portion of the trench during the shaping of the upper portion of the trench. Support for this amendment is provided at least in paragraph [0025] of the electronically filed specification "...because the lower trench surfaces are protected by the ASG layer 208, there is no shaping therein..." and in Figure 11 of the drawing. In contrast, the dopant source of Kudelka (ASG stack 105) does not serve such a masking purpose during any portion of a trench shaping process. Rather, the oxide collar 116 acts as a protective mask during lower trench shaping in Kudelka. Accordingly, in addition to the reasons set forth above, claims 26 and 27 are separately patentable on this basis.

For the above stated reasons, it is respectfully submitted that the present application is now in condition for allowance. No new matter has been entered and no additional fees are believed to be required. However, if any fees are due with respect to this Amendment, please charge them to Deposit Account No. 06-1130 maintained by Applicants' attorneys.

Respectfully submitted,
KANGGUO CHENG, ET AL.

CANTOR COLBURN LLP
Applicants' Attorneys

By _____
Sean F. Sullivan
Registration No. 38,328
Customer No. 29371

Date: December 30, 2004
Address: 55 Griffin Road South, Bloomfield, CT 06002
Telephone: (860) 286-2929